Supplementary Information

Charge separation and fullerene triplet formation in blend films of polyfluorene polymers with [6,6]-phenyl C61 butyric acid methyl ester

Jessica J. Benson-Smith\(^1\), Hideo Ohkita\(^2\), Steffan Cook\(^3\), James R. Durrant\(^3\), Donal D. C. Bradley\(^1\), Jenny Nelson\(^1\)

\(^1\) Department of Physics, Imperial College London, London SW7 2BW \\
\(^2\) Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University, Yoshida, Sakyo, Kyoto 606-8501, Japan \\
\(^3\) Department of Chemistry, Imperial College London, Exhibition Road, London SW7 2AZ

1. Determination of the LUMO energy of PCBM.

\[ E_{1/2,PCBM} = 0.5(E_{\text{ox}} + E_{\text{red}}) = -0.61 \text{ V} \]
\[ E_{\text{LUMO}} = -4.8 + E_{1/2,FC} - E_{1/2,PCBM} \]
\[ E_{-\text{LUMO}} = -3.7 \text{ V} \]

Cyclic voltammograms were measured in ODCB:Acetonitrile (4:1) solution, with 0.1M Bu4NPF6 (tetrabutyl ammonium hexafluorophosphate) vs. ferrocene Fc/Fc+. The working and counter electrodes were titanium and the reference electrode was Ag/AgCl. The scan rate was 10mV/s.

The LUMO energy was calculated from the \( E_{1/2} \) position of the first reduction peak in comparison with the reduction peak of ferrocene under the same conditions.

2. Transient optical spectrum of 50 wt% PCBM:TFMO:device.
Transient absorption spectrum measured in transmission at 1 μs after photoexcitation at 440 nm of a device structure consisting of structure glass/indium tin oxide/poly(3,4-ethylenedioxylenethiophene)-polystyrene sulfonic acid (PEDOT:PSS)/TFMO:PCBM/Al (15 nm). The TAS spectra of blend films of 5 wt% PCBM:PFO and 5 wt.% PCBM:F8BT are shown for comparison. All spectra are normalised for ease of comparison.